United States General Accounting Office

GAO

Report to Congressional Committees

May 1996

TACTICAL INTELLIGENCE

Accelerated Joint STAFS Ground Station Acquisition Strategy Is Risky

GAO/NSIAD-96-111

Recommendation

The Army lacks an analysis justifying a need to accelerate the fielding of the CGS system and can save millions of dollars by minimizing production in its second year of CGS production. Furthermore, there are inherent risks in procuring systems prior to their successful completion of an OT&E and the benefits of the Army's acquisition strategy do not clearly outweigh the associated risks. We therefore recommend that the Secretary of Defense direct the Secretary of the Army to limit the future system procurement to the minimum quantity necessary to maintain the CGS contract (i.e. one system in each contract option year) until the CGS has successfully completed an OT&E.

Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD disagreed with our conclusion that the Army's CGS acquisition strategy was unnecessarily risky and our recommendation to reduce that risk. DOD took the position that the acquisition strategy espouses prudent risk in balance with program cost, schedule, and technical requirements.

DOD's comments are reprinted in their entirety in appendix II.

Matters for Congressional Consideration

In light of DOD's unwillingness to have the Army revise its acquisition strategy for the CGS, Congress may wish to take the actions necessary to limit the number of CGS systems to be procured under LRIP prior to the CGS successfully completing operational testing.

Scope and Methodology

During this review, we interviewed officials at and reviewed documents from the offices of the Under Secretary of Defense for Acquisition and Technology and the Director for Operational Test and Evaluation in Washington, D.C. We also visited officials and reviewed documents from the U.S. Army Materiel Systems Analysis Activity, Aberdeen, Maryland, and the U.S. Army Communications and Electronics Command, Office of the Program Manager for Joint STARS, Fort Monmouth, New Jersey.

We conducted this review from August 1995 to April 1996 in accordance with generally accepted government auditing standards.

We are sending copies of this report to other appropriate congressional committees; the Director, Office of Management and Budget; and the Secretaries of Defense, the Army, and the Air Force. We will also make copies available to other interested parties upon request.

Please contact me at (202) 512-4841 if you or your staff have any questions concerning this report. Major contributors to this report were Thomas J. Schulz, Charles F. Rey, Bruce H. Thomas, and Gregory K. Harmon.

Louis J. Rodrigues
Director, Defense Acquisitions Issues

List of Congressional Committees

Chairman
Ranking Minority Member
Committee on Armed Services
United States Senate

Chairman
Ranking Minority Member
Subcommittee on Defense
Committee on Appropriations
United States Senate

Chairman
Ranking Minority Member
Committee on National Security
House of Representatives

Chairman
Ranking Minority Member
Subcommittee on National Security
Committee on Appropriations
House of Representatives

Ground Station Module Descriptions

Limited Procurement Urgent (LPU). The LPU GSMs were produced and deployed as replacements to the AN/UPD-7 Ground Station Terminal. They receive data from the Mohawk Side Looking Airborne Radar and do not receive/process data from Joint Surveillance Target Attack Radar System (Joint STARS) E8 aircraft. The Army acquired nine LPU GSMs. They are expected to be decommissioned no later than fiscal year 1997.

Interim Ground Station Module (GSM). The Interim GSM receives and processes data from both the Joint STARS E8 aircraft and the Mohawk Side Looking Airborne Radar. Eight engineering and manufacturing development Interim GSMs were developed and fielded to the XVIII Airborne. These systems represent the current GSM contingency force. The Interim GSM was deployed to Operation Desert Storm/Desert Shield. No production is planned.

Medium GSM. This module provides enhancements to the Interim GSM capability. Its development stemmed from a Department of Defense (DOD) decision that was made in fiscal year 1989 to restructure the Army Joint STARS GSM program. The Medium GSM enhancements include a downsized electronic suite, an enhanced man/machine interface with extensive Built In Test/Built In Test Equipment capabilities, and the ability to simultaneously display and analyze data from multiple sensors. The Army acquired 12 Medium GSMs.

Light GSM. This module is housed in a light weight multipurpose shelter, a standard integrated command post shelter variant, mounted on a High Mobility Multi-Purpose Wheeled Vehicle. It is to provide the light/contingency forces a C130 Drive-on/Drive-off Joint STARS capability. The Light GSM has a prime and support vehicle, each with a trailer/generator in tow. It is supposed to be able to operate on the move, receive unmanned aerial vehicle imagery and intelligence reports, and incorporate electronic map backgrounds. The Army plans to acquire a total of 10 Light GSMs.

Common Ground Station (CGS). The CGS system is to provide Light GSM functionality with the addition of the integration of secondary imagery data. Further enhancements are expected and are to be achieved through post-award modifications to the contract. Two versions of this ground station are being contemplated (i.e., a light and heavy CGS). The Light CGS will be patterned on the Light GSM two-vehicle configuration. The heavy CGS is to be a track-mounted system, intended to provide the heavy forces a high speed, cross-country/off-road GSM. It is to be integrated into a

Bradley Fighting Vehicle variant. Integration of the CGS capability into a tracked vehicle is part of the preplanned product improvement initiatives and will not be included in the fiscal year 1996 CGS contract award. Initial CGS fielding is planned for fiscal year 1998. The Army currently anticipates the acquisition of 73 CGS systems.

Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

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ACQUISITION AND TECHNOLOGY

JAN 2 4 1996

Mr. Louis J. Rodrigues
Director, Defense Acquisition Issues
National Security and International
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Washington D.C. 20548

Dear Mr. Rodrigues:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "TACTICAL INTELLIGENCE: Further Joint STARS Ground Station Testing Needed Prior to New Buys," (GAO Code 707119), OSD Case 1063. The Department nonconcurs with the report.

The acquisition strategy for the Joint Surveillance Target Attack Radar System Common Ground Station was developed by the program director in concert with an Army/Air Force/Office of the Secretary of Defense team and approved by the Under Secretary of Defense for Acquisition and Technology. The strategy incorporates the user's technical and schedule requirements, streamlining of acquisition processes, and prudent risk to deliver rapidly changing computer and communication technology before it becomes obsolete.

The detailed DoD comments to the report recommendations are provided in the enclosure. Technical corrections were also provided separately. The Department appreciates the opportunity to comment on the draft report.

George R. Schneiter
Director
Strategic and Tactical Systems

Enclosure

GAO DRAFT REPORT - DATED DECEMBER 7, 1995
(GAO CODE 707119) OSD CASE 1063

"TACTICAL INTELLIGENCE: FURTHER JOINT STARS GROUND STATION TESTING NEEDED PRIOR TO NEW BUYS"

DEPARTMENT OF DEFENSE COMMENTS
ON THE GAO FINDINGS AND RECOMMENDATIONS

FINDING A: Low-Rate Initial Production (LRIP) Acquisitions Prior to Operational Test and Evaluation Raise Program Risks. The GAO found that the Army plans to acquire more Common Ground Station (CGS) units for the Joint Surveillance Target Attack Radar System (Joint STARS) through two years of LRIP than are needed for the CGS initial operational test and evaluation (OT&E) scheduled to start in the first quarter of FY 1997. The GAO asserted that the Army needs and plans to use only four of the LRIP CGS modules for the initial OT&E. The GAO noted that the Army accelerated the CGS program at the direction of the Under Secretary of Defense for Acquisition and Technology, which resulted in a plan to move the CGS first fielding date from FY 2002 to FY 1998. However, the GAO stated that the DoD and the Army do not have analyses demonstrating a requirement to field the CGS system four years earlier than originally planned or showing that the benefits of that acceleration outweigh the associated risks. The GAO concluded that the Army plan to acquire 18 more CGS systems than are needed to perform the CGS initial OT&E, bypasses an important acquisition process internal control for about 25 percent of the total expected CGS buy. The GAO emphasized that, over the years, it has reported on numerous instances in which production of both major and nonmajor systems were optimistically permitted to begin under LRIP and continue based on factors other than the systems' technical maturity. For example, in a November 1994 report on the use of LRIP in the acquisition process (GAO Code 707065/OSD Case 9725), the GAO detailed a number of systems that entered LRIP before operational tests were conducted and later experienced significant problems. The GAO cited the Navy T-45A aircraft as one example that was one year into LRIP when OT&E found it was not effective in a carrier environment and was not operationally suitable because of safety deficiencies. The GAO indicated that subsequent major design changes to the T-45A included a new engine, new wings, and a modified rudder. The GAO continued to conclude that the Army CGS acquisition strategy demonstrates inherent risk. (pp. 1-3, pp 8-10/GAO Draft Report)

Now on pp. 1-2 and pp. 5-6.

DoD RESPONSE: Nonconcur. The acquisition strategy for the Common Ground Station, developed by an Army/Air Force/OSD team

See pp. 2, 8, and 9.

and approved by the Under Secretary of Defense for Acquisition and Technology, espouses prudent risk in balance with program cost, schedule, and technical requirements.

See p. 5.

See p. 2.

In 1993, the Under Secretary of Defense for Acquisition directed the initial fielding of the CGS move from 2002 to 1998 to better meet user requirements and improve the acquisition process. The revised CGS development and production schedule fields ground stations in synch with E-8C aircraft deliveries and uses streamlined acquisition management processes. From a technical standpoint, the approach takes the established Light Ground Station Module (LGSM) functional baseline and incorporates rapidly changing computer and communications technology as product improvements, rather than a complete system redesign. The alternative, a sequential develop-test-produce approach, would have taken six years to deliver the first CGS, too long for a system based on rapidly changing technology and an unacceptable delay in establishing real-time ground surveillance capability.

See pp. 2, 5, and 6.

The operational requirement for Joint STARS exists today; it is not a projected need for 1998 or 2002. The Joint System Operational Requirements Document for Joint STARS, dated 18 February 1992 (S), identifies existing deficiencies and sets requirements including the number of aircraft orbits and the number of corps to support simultaneously. The Joint STARS performance in Desert Storm, even though just in development, was lauded by operational commanders. As a result, the Army and Air Force agreed to maintain the ability to deploy Joint STARS throughout the development program. Operational commanders have requested the use of Joint STARS several times since then. The aircraft and ground stations supporting the Implementation Force in Bosnia-Herzegovina are that contingency capability. If additional assets were available today, they would be in use. The Army has 8 Interim Ground Station Modules and is producing 12 Medium Ground Station Modules (MGSM) and 10 LGSMs. The user needs the more-capable CGS as soon as it can be fielded.

See pp. 5 and 6.

The CGS is not a new, immature system such as the Navy T-45A aircraft cited as an example. Rather, the CGS has the same functional baseline as the LGSM. The CGS uses 100 percent of the LGSM mechanical design, rack structure, power distribution, lighting, heating, ventilation, and air conditioning. Much of the integration effort is government furnished equipment, identical to those items used in the LGSM. The software baseline of the LGSM is the software baseline for the CGS. New functionality will be added through software update in manageable, low risk increments. Motorola, who developed the previous GSMs and who has 15 years experience in ground stations, was awarded the CGS LRIP contract. Low-rate initial production is designed to establish and prove production capability as well

See comment 1.

See pp. 4 and 8.

as to provide production articles for testing. The CGS LRIP quantity includes not only the number needed for test purposes, but considers production rate efficiencies and cost factors. Producing only four prior to test would require the stop and restart of production, resulting in loss of skilled people, inefficient use of contractor resources, and higher costs.

FINDING B: Prior Test Results Indicate Risks. The GAO also found that the Army Joint STARS GSMs have undergone limited prior testing and have demonstrated disappointing results in those tests. The GAO asserted that those facts further indicate risks associated with the Army CGS acquisition strategy, which will allow the Army to begin procuring CGS systems without demonstrating that the issues raised as a result of those prior tests have been resolved. The GAO noted that the MGSM underwent a Limited User Test rather than a traditional initial OT&E in early 1993. The GAO observed that, although the MGSM demonstrated the potential to be operationally effective and suitable, the Army Operational Test and Evaluation Command assessment also stated that, "Current software lacks robustness and reliability, and limits mission performance." The GAO indicated that the Command recommended, among other things, that the MGSM successfully complete an independently evaluated operational demonstration, which has yet to occur.

The GAO also found that the MGSM follow-on system, the LGSM, has not been subjected to an operational test and evaluation, although the GAO noted that it underwent other tests, including a Force Development Test and Evaluation, Reliability Confidence Testing, and a follow-on demonstration at Eglin Air Force Base. However, based on a preliminary review of those test results, the GAO reported in May 1995 (GAO Code 707118/OSD Case 9951) that it was clear the LGSM had not met the DoD-set LRIP exit criteria for those tests, and that the LGSM had only passed 2 of the 12 performance-related criteria. At the same time, the GAO observed that the DoD Director, OT&E, concluded that the LGSM had passed only 1 of the 12 criteria, and recommended a formal review of the program to identify the causes of the problems, fixes, and appropriate tests to demonstrate the fixes. Also, according to a DoD official, the GAO asserted that the Director's assessment of the LGSM performance during those tests has not changed, but that the issue was resolved based on the Director's satisfaction "that the Army has identified a process to fix the various problems that have been identified..." The GAO concluded that how well the Army process has worked to fix those problems remains to be demonstrated during the multi-Service OT&E. The GAO further concluded that the limited nature of Joint STARS GSM testing to date, and the poor performance of the GSMs in that testing,

Now on pp. 6-8.

indicates great risks in procuring CGS systems at this time. (pp. 10-13/GAO Draft Report)

DoD RESPONSE: Nonconcur. Testing of the Joint STARS GSMs has been a continuous fix-test-fix process throughout development, a process which has identified shortfalls, determined fixes, and verified or tested the results. During Desert Storm, operational commanders lauded the big-picture, real-time capability provided by the Interim GSMs. System improvements have corrected limitations identified at that time. A series of test events has been used in the development of the GSMs including a Limited User Test, Force Development Test and Evaluation, Reliability Confidence Testing, and other demonstrations. In some instances, problems were attributed to shortfalls in operator training or another non-materiel cause. The majority of deficiencies involved software fixes, not major hardware redesign. The Army has also gained experience operating the GSMs assigned to the III Corps and XVIII Airborne Corps and in training and preparation for multi-Service OT&E. In November 1995, the Program Executive Officer for Joint STARS certified the system ready for OT&E, which attests to the developer's confidence in system maturity. During the current deployment to the European Theater, members of the Army and Air Force test commands will conduct operational evaluation of Joint STARS performance. Note: The DoD also nonconcurred with the finding and recommendation of the GAO report, "Production of Joint STARS LGSM", referenced in this section.

See pp. 6-8.

See p. 8.

RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to delay procurement of CGS systems until currently procured GSMs have successfully completed an operational test and evaluation, if it is determined that the CGS and Light GSM systems are significantly technologically similar. (pp. 13/GAO Draft Report)

Now on p. 9.

DoD RESPONSE: Nonconcur. The CGS acquisition strategy accepts prudent risks to field rapidly changing computer and communication technology before it is obsolete. The CGS uses the LGSM functional baseline, but will incorporate product improvements and additional capabilities. Results of operational testing of the MGSM and LGSM will be incorporated into the CGS if applicable. The CGS acquisition strategy allows for operational assessment/testing of the CGS in FY 1998.

See comment 2.

Now on p. 9.

RECOMMENDATION 2: The GAO further recommended that, if the Light GSMs are not similar enough to serve as a basis for a production decision, the Secretary of Defense direct the Secretary of the Army to limit the procurement of CGS systems to the minimum quantity necessary for planned CGS initial OT&E. (pp. 13/GAO Draft Report)

See comment 3.

DoD RESPONSE: Nonconcur. Limiting the GCS LRIP buy to the four units needed for test would result in a break in production, loss of experienced personnel, higher costs, and a two-year delay in fielding the initial CGS units. The CGS acquisition strategy accepts prudent risks to field rapidly changing computer and communication technology before it is obsolete. The CGS uses the LGSM functional baseline, but will incorporate product improvements and additional capabilities. Results of operational testing of the MGSM and LGSM will be incorporated into the CGS if applicable. The CGS acquisition strategy allows for operational assessment/testing of the CGS in FY 1998.

The following are GAO's comments on DOD's letter dated January 24, 1996.

GAO Comments

1. While the CGS contractor has prior experience developing and producing ground stations, those ground stations have undergone limited testing and demonstrated disappointing results. Among its previous work, the CGS contractor developed and produced the two immediate predecessor GSMs to the CGS, the Medium and Light GSMs. As we stated in our report, based on the results of a limited user test of the Medium GSM, the Army Operational Test and Evaluation Command stated that the Medium GSM consistently demonstrated the potential to be operationally effective and the potential to be operationally suitable. It noted that the "current software lacks robustness and reliability, and limits mission performance." It recommended, among other things, that prior to LRIP fielding the Medium GSM "must successfully complete an independently evaluated operational demonstration including simultaneous employment of all software, interface, and tactics, techniques, and procedures corrections." Furthermore, the Light GSM passed only 1 of 12 performance-related criteria during developmental testing, and neither the Medium nor the Light GSM has yet successfully completed an OT&E.

2. We continue to believe that the CGS acquisition strategy risks millions of dollars on systems that have not yet been demonstrated operationally effective and suitable. We have, however, revised the report to reflect the Army's apparent commitment to evaluate the operation of the Joint STARS system during deployment to Bosnia-Herzegovina.

3. We have revised our recommendation to allow the Army to maintain its CGS contract in effect and thus avoid a break in production. Because the contract provides decreasing unit costs over its life, and since the Army has already committed to 18 first-year LRIP systems, we want to further limit LRIP pending successful completion of an OT&E.